

The Role of Pre-Mission Testing in The National Missile Defense System

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ABSTRACT

The purpose of the National Missile Defense (NMD) system is to provide detection, discrimination, engagement, interception, and negation of ballistic missile attacks targeted at the United States (U.S.), including Alaska and Hawaii. This capability is achieved through the integration of weapons, sensors, and a battle management, command, control and communications (BMC3) system. The NMD mission includes surveillance, warning, cueing, and engagement of threat objects prior to potential impact on U.S. targets.

The NMD Acquisition Strategy encompasses an integrated test program using Integrated Ground Tests (IGTs), Integrated Flight Tests (IFTs), Risk Reduction Flights (RRFs), Pre Mission Tests (PMTs), Command and Control (C2) Simulations, and other Specialty Tests. The IGTs utilize software-in-the-loop/hardware-in-the-loop (SWIL / HWIL) and digital simulations. The IFTs are conducted with targets launched from Vandenberg Air Force Base (VAFB) and interceptors launched from Kwajalein Missile Range (KMR). The RRFs evaluate NMD BMC3 and NMD sensor functional performance and integration by leveraging planned Peacekeeper and Minuteman III operational test flights and other opportunities without employing the NMD interceptor. The PMTs are nondestructive System-level tests representing the use of NMD Element Test Assets in their IFT configuration and are conducted to reduce risks in achieving the IFT objectives. Specifically, PMTs are used to reduce integration, interface, and performance risks associated with Flight Tests to ensure that as much as possible, the System is tested without expending a target or an interceptor.

This paper examines several critical test planning and analysis functions as they relate to the NMD Integrated Flight Test program and, in particular, to Pre-Mission Testing. Topics to be discussed include:

- Flight-test program planning;
- Pre-Test Integration activities; and

- Test Execution, Analysis, and Post-Flight Reconstruction